REMARKS/ARGUMENTS

Claims 34-35, 37-49, 51-62, and 64-66 are currently pending. Claims 34, 47, 49, 51, 54, and 61 have been amended. No new matter is presented for examination. Claims 36, 50, and 63 have been canceled.

Claims 47 and 54 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Claims 47 and 54 have been amended to address these rejections.

Claims 49, 52-54, and 56 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Duncan et al. (U.S. Patent No. 5,905,591). Claims 61 and 63-66 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Braunecker et al. (U.S. Patent No. 6,426,834 B1). Claims 34-37, 39-40, 42-43, and 47 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Duncan et al. in view of Korsch (U.S. Patent No. 4,101,195). Claims 38 and 44-45 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Duncan et al. in view of Korsch as applied to claim 34, and further in view of Braunecker et al. Claims 46 and 50-51 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Duncan et al. in view of Korsch and Braunecker et al., as applied to claim 45, and further in view of Cook (U.S. Patent No. 5,550,672). Claim 48 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Duncan et al., in view of Korsch as applied to claim 34, and further in view of the LAMA Project Overview. Claims 55 and 58-59 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Duncan et al. in view of Braunecker et al. Claim 60 is rejected under 35 U.S.C. §103(a) as being unpatentable over Duncan et al. in view of Braunecker et al. as applied to claim 59, and further in view of Cook. Claim 62 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Braunecker et al. in view of Korsch. Claims 41 and 57 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Claim 49 has been amended to include the limitations of claim 50. No new matter is presented for examination as amended claim 49 has been amended to include limitations that were previously presented for examination. Duncan does not anticipate amended claim 49 as

Duncan fails to disclose every limitation recited in amended claim 49. For example, claim 49 as amended recites "a plurality of phase plates corresponding to the plurality of collector telescopes, each phase plate is disposed approximately at or near the image plane of a corresponding collector telescope and has a surface adapted to adjust phase relationships of the images, wherein the phase relationships include sine magnification errors."

The Examiner asserts that the fine and course movement mirrors of Duncan are the "phase plates" recited in claim 49 and have surfaces adapted to adjust phase relationships of images. Applicants respectfully disagree with this position. Specifically, the fine and course movement mirrors of Duncan are configured to move (i.e., "tilt or piston," col. 6, line 44) to adjust the "path lengths traveled" (see Duncan at col. 6, lines 46-47) by the various beams. By adjusting the path lengths, the distances the beams travel may be "maintained equal," (see Duncan at col. 6, line 49). By maintaining equal path lengths of the beams, the wavefronts of the beams may be aligned. By aligning the wavefronts, a phase error of the combined beams is corrected. Stated alternatively, Duncan's fine and course movement mirrors are configured to be tilted or pistoned to correct lag (or path length difference) between the beams, and thereby correct a phase error of the combined beams.

The Duncan fine and course movement mirrors do not have surfaces configured to adjust a phase relationship of individual images formed by individual collector telescopes, but (as discussed above) are configured to move to adjust path length differences. Because a mirror has a flat surface, this does not in any way imply the mirror is configured to adjust a phase relationship of an image and a sine magnification error. Moreover, the correction of path length differences are not equivalent to correction of a phase relationship of an individual image formed by an individual collector telescope. From a physical point of view, the two phenomena are inherently different. This difference is explained in further detail.

As briefly mentioned above, the "phase plates" recited in claim 49 have surfaces that are configured to "adjust the phase relationships" of associated "images." That is, each image formed by each collector telescope has an associated phase relationship. And each phase plate is configured to adjust the phase relationship of an associated image formed by an associated collector telescope.

To further clarify, the term "phase" as used in Duncan and the instant application is used in a different sense. Duncan uses the term phase to refer to phase differences between beams and to refer to the phase errors of combined beams. In the context of claim 49, the term phase refers to the "phase relationship" of an image, wherein each individual image (formed by each collector telescope) has its own phase relationship.

Therefore, the Duncan fine and course movement mirrors do not have surfaces "adapted to adjust phase relationships of the images" and neither are these mirrors configured to adjust "sine magnification errors." Not only are the Duncan fine and course movement mirrors not configured to adjust sine magnification errors, Duncan fails to disclose any optical elements configured to adjust sine magnification errors. These differences clearly distinguish claim 49 from Duncan. Therefore, amended claim 49 is not anticipated by Duncan.

Duncan in combination with Braunecker fails to render amended claim 49 obvious as these references fail to teach, or even suggest, every limitation recited in claim 49. As discussed above, Duncan fails to teach or suggest a phase plate that has "a surface adapted to adjust phase relationships of the images, wherein the phase relationships include sine magnification errors." Braunecker fails to make up for these deficiency of Duncan.

Specifically, Braunecker fails to teach or suggest a phase plate configured to correct for "sine magnification errors" as recited in amended claim 49. The Braunecker device is an off axis optical device introducing "asymmetry errors" in collected electromagnetic radiation. The asymmetry error is corrected by a transmission plate shown in Braunecker's FIG. 1. More specifically, the asymmetry errors are introduced by the tilting of Braunecker's primary mirror. See Braunecker at col. 6, lines 60 - 62.

Sine magnification errors are different from asymmetry errors and derive from a different optical configuration. Sine magnification errors derive from magnification variation across a distributed aperture optical system. See, for example, page 2, lines 16 - 22. Sine magnification errors are unique errors associated with distributed aperture optical system and are not associated with single aperture systems (e.g., Braunecker's off axis systems). As discussed above, asymmetry errors derive from a single aperture device having an off axis configuration. Therefore, the asymmetry errors associated with Braunecker's off axis system are not sine

magnification errors and Braunecker's transmission plate is not configured to correct sine magnification errors. Therefore, Braunecker fails to make up for the deficiencies of Duncan. Therefore, Duncan and Braunecker fail to render amended claim 49 obvious.

Cook fails to make up for the deficiencies of both Duncan and Braunecker. Similar to Braunecker, Cook discloses an off-axis single-aperture system and a corrector mirror configured to correct asymmetry errors. See Cook at col. 3, lines 50-55. As discussed above with respect to the Braunecker reference, asymmetry errors are different from sine magnification errors and derive from a different optical configuration than asymmetry errors. Specifically, asymmetry errors derive from asymmetrically disposed optical elements in a single aperture device, whereas sine magnification errors derive from magnification variation across a distributed aperture optical system. Because Cook fails to mention distributed aperture optical systems, Cook fails entirely to teach or suggest a phase plate configured "to adjust a phase relationship associated with a sine magnification error" as recited in amended claim 49.

Therefore, Cook fails to make up for the deficiencies of Duncan and Braunecker. Therefore, Duncan in view of Braunecker and Cook fails to render amended claim 49 obvious.

Claim 61 has been amended to include the limitations of claim 63. No new matter is presented for examination as amended claim 61 has been amended to include limitations that were previously presented for examination. Braunecker does not anticipate amended claim 61 as Braunecker does not disclose every feature recited in amended claim 61. For example, claim 61 as amended recites "a phase plate that is configured to approximately phase the electromagnetic radiation transmitted through the phase plate to reduce distortion in a resulting image, wherein the distortion is associated with a sine magnification error."

Braunecker fails to disclose a phase plate configured to correct for "sine magnification error" as recited in amended claim 61. As discussed above, the Braunecker device is an off axis optical device that introduces an asymmetry error into collected electromagnetic radiation. More specifically, the asymmetry error is introduced by tilting Braunecker's primary mirror. See Braunecker at col. 6, lines 60 - 62. The asymmetry error is corrected by a transmission plate shown in Braunecker's FIG. 1.

As discussed above, sine magnification errors are different from asymmetry errors and derive from a different optical configuration than asymmetry errors. Sine magnification errors derive from magnification variation across a distributed aperture optical system. See, for example, page 2, lines 16 - 22. Sine magnification errors are unique errors associated with distributed aperture optical system and are not associated with single aperture systems (e.g., Braunecker's off axis systems). Asymmetry errors derive from a single aperture device having an off axis configuration. Therefore, the asymmetry errors associated with Braunecker's off axis system are not sine magnification errors and Braunecker's transmission plate is not configured to correct sine magnification errors. Therefore, Braunecker does not anticipate amended claim 61.

Braunecker in combination with Korsch fails to render amended claim 61 obvious, as these references fail to teach, or even suggest, every limitation recited in claim 61. As discussed above, Braunecker fails to teach or suggest a phase plate configured to correct a "sine magnification error" as recited in amended claim 61.

Korsch fails entirely to make up for the deficiencies of Braunecker. Korsch discloses an optical device having an ellipsoid primary mirror, a hyperbolic secondary mirror, an optional flat fold mirror, and a convex tertiary mirror. Nowhere does Korsch describe that any of these elements is configured to a adjust phase relationship and certainly does not describe that any of these elements is configured to correct a sine magnification error. Therefore, Korsch fails entirely to make up for the deficiencies of Braunecker. Therefore, Braunecker and Korsch fail to render claim 61 obvious.

Claim 34 has been amended to include the limitations of claim 36. <u>No new matter is presented for examination as amended claim 36 has been amended to include limitations that were previously presented for examination</u>. Amended claim 34 is not obvious in view of Duncan and Korsch, as these references, either alone or in combination, fail to teach or suggest every limitation in amended claim 34. For example, claim 34 as amended recites "a phase plate disposed within a vicinity of the intermediate image plane, wherein the phase plate is configured

to adjust a phase relationship associated with a sine magnification error of the portion of the electromagnetic radiation associated with a resulting image."

Duncan describes a sub-aperture telescope having a "flat mirror" disposed to reflect electromagnetic radiation from a secondary mirror to a tertiary mirror. See Duncan at col. 6, lines 9 - 10. The Examiner asserts that the flat mirror so disposed is a "phase plate" "configured to adjust a phase relationship" as recited in amended claim 34. Applicants respectfully disagree. Nowhere does Duncan teach, or even suggest, the flat mirror presently discussed is configured to adjust a phase relationship. Applicants respectfully request that the Examiner indicate the specific language in Duncan that describes the presently discussed mirror to be a phase plate configured to adjust a phase. Applicants particularly point out that merely because a mirror is flat, flatness does not in any way imply the mirror is configured to adjust a phase relationship.

Because Duncan fails to teach, or even suggest, "a phase plate disposed within a vicinity of the intermediate image plane, wherein the phase plate is configured to adjust a phase relationship associated with a sine magnification error" as recited in amended claim 34, claim 34 as amended is not rendered obvious by Duncan.

Korsch fails entirely to make up for the deficiencies of Duncan. Korsch discloses a telescope having an ellipsoid primary mirror, a hyperbolic secondary mirror, an optional flat fold mirror, and a convex tertiary mirror. Nowhere does Korsch describe any of these elements, or any other elements, as being configured to adjust a phase relationship. Therefore, Korsch fails entirely to make up for the deficiencies of Duncan. Therefore, Duncan and Korsch fail to render amended claim 34 obvious.

Braunecker fails to make up for the deficiencies of both Duncan and Korsch. As discussed above, Braunecker fails to teach, or even suggest, a phase plate configured to adjust a phase relationship associated with a sine magnification error. Therefore, Duncan in view of Korsch and Braunecker fails to render amended claim 34 obvious.

Cook fails to make up for the deficiencies of Duncan, Korsch, and Braunecker. Similar to Braunecker, Cook discloses an off-axis single-aperture system and a corrector mirror configured to correct asymmetry errors. See Cook at col. 3, lines 50-55. As discussed above

with respect to the Braunecker reference, asymmetry errors are different from sine magnification errors and derive from different optical configurations than asymmetry errors. Specifically, asymmetry errors derive from asymmetrically disposed optical elements in a single aperture device, whereas sine magnification errors derive from magnification variation across a distributed aperture optical system. Because Cook fails to mention distributed aperture optical systems, Cook fails entirely to teach or suggest an phase plate configured "to adjust a phase relationship associated with a sine magnification error" as recited in amended claim 34.

Therefore, Cook fails to make up for the deficiencies of Duncan, Korsch, and Braunecker. Therefore, Duncan in view of Korsch, Braunecker, and Cook fails to render amended claim 34 obvious.

The LAMA documents fail entirely to make up for the deficiencies of Duncan and Korsch as the LAMA documents fail to discuss any methods of adjusting a phase relationship associated with a sine magnification error. The LAMA documents discuss a cost and feasibility overview for launching a multi-aperture telescope into Earth orbits. While the LAMA documents discuss desired objectives (e.g., aperture size, resolution, etc.) for a multi-aperture telescope, the LAMA documents fail to discuss any detailed aspects of telescope design and certainly do not discuss an apparatus for adjusting a phase relationship associated with a sine magnification error. Therefore, Duncan in view of Korsch and the LAMA documents fails to render amended claim 34 obvious.

Additionally, the LAMA documents do not appear to be prior art against the present application. The priority data of the present application is November 14, 2000. The LAMA documents on the website http://www.astro.ubc.ca/lmt/lama/documents.html (referred to by the Examiner) were updated on 09/12/2002. The Examiner has not indicated whether the cited LAMA documents were updated on this date and what information was added to the LAMA documents on this date. Therefore, it does not appear from the website and documents provided with the Office Action that the cited LAMA documents are prior art as to the present application. Should the Examiner continue to cite the LAMA documents against the present application, Applicants respectfully request the Examiner provide the publication date of the cited LAMA documents.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is urged.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

Rodney C. LeRoy

Rodney C. LeRoy
Reg. No. 53,205

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
RCL:cmm
60105027 v1